WRIGHT-PATTERSON AIR FORCE BASE, AREA B,
BUILDING 22B, GUN RANGE STRUCTURE
DAYTON VIC.
GREENE COUNTY
OHIO

HAER No. OH-79-T

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

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HISTORIC AMERICAN ENGINEERING RECORD

WRIGHT-PATTERSON AIR FORCE BASE, AREA B, BUILDING 22B, GUN RANGE STRUCTURE

HAER No. OH-79-T

Location: Between 10th and 11th Streets, east of Building 22; Wright-Patterson Air Force Base, Area B, Dayton Vicinity, Greene County, Ohio.

Date of Construction: 1944.

Construction Contractor: Frank Messer and Sons, Inc.

Present Owner: USAF.

Present Use: Electronic Technology Laboratory, Electro-Optics Division.
U.S. Army Corps of Engineers area office.
Avionics Directorate of Wright Laboratory, administrative section.

Significance: Building 22B was built during World War II as part of the Building 22 Armament Laboratory complex. It housed a gun range designed for specialized testing of aircraft gun systems.

Project History: This report is part of the overall Wright-Patterson Air Force Base, Area B documentation project conducted by HAER 1991-1993. See overview report, HAER No. OH-79, for a complete description of the project.

DESCRIPTION: The Armament Laboratory incorporates three interconnected sections. The main portion of the structure is a large steel-framed central hangar with barrel-vaulted roof measuring 284' x 248'. The hangar faces east toward the gun range and has large doors consisting of metal-framed windows suspended on rollers. There are tall concrete towers at all four corners. Two smaller concrete wings are attached to the north and south ends. These are rectangular cast-in-place concrete structures, each with a ten-bay front. Originally, these sections were both 51' wide, and 202' and 233' long, respectively, but in 1952 a two-story addition increased the south wing to twice its original size. Building 22B (the 200 Yard Gun Range Structure) stands to the east of Building 22, on the north side of the Gun Range.

HISTORY: Wright Field's construction boom of World War II increased the number of buildings at the installation almost eight-fold. Building 22 was the first new structure to be completed along the flightline, built in 1942 to accommodate the expanded wartime activities of the Materiel Command Armament Laboratory. Building 22 was several times larger than Building 21, the Old Armament Laboratory (as it became known) and the hangar's personnel also administered three nearby gun ranges. These included a 25-yard range adjacent to the hangar, an enormous 500-yard gun range which extended to the east of the hangar, and Building 22B, a 200-yard indoor gun range also to the east.

The 25-yard range and 500-yard ranges were in the open, while a trio of 200-yard ranges were enclosed in the concrete structure of Building 22B, built in 1944 by Frank Messer & Sons, Inc. Although these were called the 200-yard gun ranges, they were actually only 425' long. The three ranges, "A", "B", and "C", were all 25' high, but they differed in width at 21', 22', and 43' respectively. The walls and ceilings were constructed of reinforced concrete, with backstops at the east end of the range tunnels consisting of sand pits with the sand sloping forward at approximately 35 degrees. Hardwood timbers above the sand and secured to the ceiling with channel irons prevented ricocheting projectiles from damaging the concrete, while rows of steel plate hanging from the ceiling near the backstops prevented ricochets from bouncing toward the west end where the guns were. Exhaust fans at the east end of the tunnels removed some of the smoke and gases from the range. In addition, an exhaust fan on the roof near the west end captured powder gases and smoke close to the muzzle blast area. Sound absorbing tubes lined the walls and ceilings of the west end to reduce the noise level and stop reverberations within the tunnels.

The tests were controlled from a centrally located booth which

was constructed in a manner that allowed the armorers to see the weapons and other test specimens at all times through bullet-resistant glass windows. Range "A" also provided a camera opening for taking photographs of bullets striking any target or piece of equipment being fired upon. Range "C" differed from the other ranges in that it was open to the ramp adjacent to the hangar and two bed plates were installed end-to-end within the tunnel mouth to accommodate large stands, such as those required for large turrets and entire nose sections. One bed plate was located next to a nose-wheel pit, used to facilitate the firing of fighter aircraft. Numerous tie-downs provided a means to secure all types of aircraft, including bombers, for turret tests and to test entire fixed-gun installations.

Between 1959 and 1967, the Air Force spent only $170,000 on research for aircraft gun systems. By the mid-1970s, the Electro-Optics Division of the Electronic Technology Laboratory began to utilize the building. With a straight length of 425', this building provided useful facilities for their research on equipment such as electronic sighting systems for weapons and laser-guided weapons systems. This division still occupies Building 22B.

Also in the mid-1970s, some offices of the Avionics Laboratory moved in for the remainder of the decade. In the early 1980s, Building 22B hosted offices for System Program Office (SPO) Cadres. This short-lived program was intended to establish full SPOs from skeleton-crew SPO Cadres which oversaw preliminary system developments until final system approval was received. In 1992 the office portion of the building housed the administrative section of the Avionics Directorate of Wright Laboratory and the U.S. Army Corps of Engineers area office.

For bibliography, see Wright-Patterson Air Force Base overview report (HAER No. OH-79).